# The pivotal functionality of the amyloid protein TasA in *Bacillus* physiology and fitness

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Biofilms are complex bacterial communities formed on any surface and composed of cells embedded in an extracellular matrix, in which the amyloid protein TasA is the major protein component. It has been demonstrated that the genetic pathways involved in formation of biofilms are active in the interaction of *B. subtilis* with plant surfaces, where it exhibits antagonistic activity against different pathogens[1], leading us to hypothesize a major contribution of the extracellular matrix in the ecology of *B. subtilis* in the plant phylloplane. In this work, we show that TasA has a meaningful role in adhesion and biofilm formation over the plant phylloplane, however, despite the inability of the *tasA* mutant to form a biofilm, it still retained a similar antagonistic activity compared to the wild-type strain. Transcriptomic analysis of the mutant revealed unexpected variations in the expression levels of over 800 genes, suggesting that besides its structural role, TasA might have a regulatory function on the physiological stage of cells. We evaluated our hypothesis using a wide range of techniques, including Transmission Electron Microscopy (TEM) and confocal microscopy along with different fluorescent dyes to stain bacteria based on different typical properties of the stationary phase of growth. Our results suggest that the absence of TasA causes a global regulatory change that ends in premature colony aging. This work supports the importance of this functional amyloid in regulating bacterial physiology and fitness.

**References**

1. - Zeriouh, H., de Vicente, A., Perez-Garcia, A. & Romero, D. Surfactin triggers biofilm formation of Bacillus subtilis in melon phylloplane and contributes to the biocontrol activity. *Environ Microbiol* **16**, 2196-2211, doi:10.1111/1462-2920.12271 (2014).